

# ***Chesapeake Bay Program Scientific and Technical Assessment Committee Monitoring, Assessment, and Indicator Review Subcommittee Meeting Report***

9 September 2006

## **Introduction**

At the Scientific and Technical Advisory Committee (STAC) meeting of 12-13 June 2006, a subcommittee was requested to begin review of the Status and Health Report of the Chesapeake Bay (charge from CBP is attached). Subcommittee members are Mr. Gary Matlock of NOAA, Dr. Kirk Havens of VIMS, and Dr. Denice Wardrop of Penn State. The following specific charges were given to STAC by the CBP:

- Have the appropriate measures for assessing ecosystem health been established?
- Have the appropriate measures for assessing restoration efforts been established?
- Do the published assessments clearly and accurately describe the Bay's health and restoration status?

As a first step, on August 14, 2006, Denice Wardrop and Kirk Havens met with Dr. Bill Dennison and Dr. Ben Longstaff of the University of Maryland Center for Environmental Science (UMCES) Integration and Application Network (IAN). Talking points were prepared beforehand and shared by all meeting attendees. Dr. Longstaff provided background by a succinct recounting of the Moreton Bay experience. Two main characteristics of successful communication of the state of the Bay were extensively discussed: timeliness and the spatial representation of results. For example, Moreton Bay provides an excellent example of local waterway synthesis. Of interest is the manner in which the final determinations of report card "grades" were determined: 80% of the grade was provided by the Eco-health grade, and the remaining 20% by Expert Data Interpretation. This method is appealing because it provides a defined role for technical input. In the context of the meeting, all talking points were addressed, although not in a linear fashion. Thus, in order to synthesize, the resulting salient and identifiable issues are presented individually in the following section.

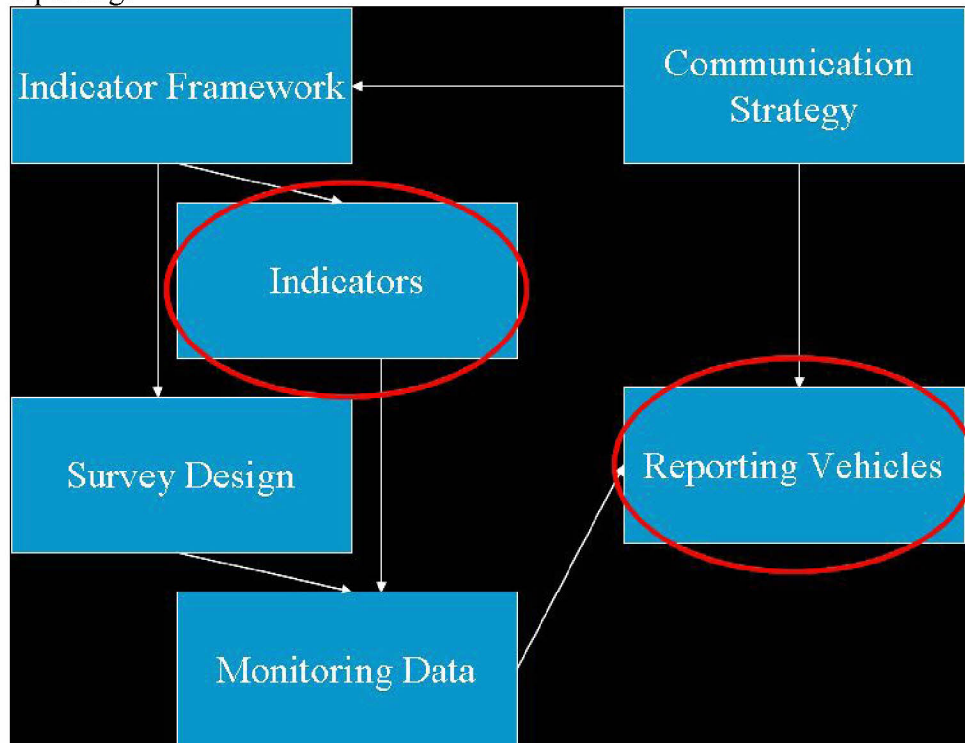
## **Results**

As discussion progressed from general to specific, the group focused on potential roles for STAC in the area of condition assessment and reporting. These discussions were inclusive of the Status and Health condition Report, the proposed concept of a "report card", as well as other potential outlets for information. They are summarized separately as follows.

## **Indicator Framework**

Effective assessment, reporting, and communication of indicators does not happen as a collection of independently derived processes, as recognized by the CBP's Indicator Review Team (IRT). A simple depiction of the process is presented in Figure 1; all processes are connected in a systematic way, and all are derived from, and based on, an indicator framework. The actual mandates given to STAC are circled. It quickly became obvious that STAC could not provide input to indicators and reporting vehicles without extensively considering the indicator framework on which they were based.

Figure 1. A conceptual diagram of a system for indicator selection, assessment, and reporting.



The IRT has worked extensively to formulate an indicator framework, and it incorporates a number of sound, useful, and relevant concepts. However, the importance of the indicator framework cannot be overstated, because of its foundational role in all aspects of assessment and reporting. In addition, the indicators that are developed under the auspices of the CBP should not be limited in utility to the CBP only. Indicator frameworks should provide a roadmap to regional and local environmental managers on the appropriate indicators to utilize in decision-making. To our knowledge, no extensive survey of environmental managers in the Bay watershed has ever been undertaken to extract the useful and necessary characteristics of indicators for their widespread use outside of the CBP.

**Recommendation #1:** STAC should formulate a standing committee to provide an independent review of the indicator framework, considering new contributions to the literature. Presentation to the entire STAC would follow.

**Recommendation #2:** Under the auspices of the CBP, a survey of environmental managers should be undertaken to assess important elements of indicators and reporting.

### ***Indicator Selection***

Dr. Dennison and Dr. Longstaff summarized their criteria for good indicators as the following questions: Is it measurable, model-able, and map-able? These criteria have a great deal of similarity to the indicator taxonomy developed for the Atlantic Slope Consortium (ASC) (i.e., what's the question, spatial/temporal context, and reference

condition of the indicator, <http://www.asc.psu.edu/>). The Chesapeake Bay Program (CBP) currently has over 100 “indicators”; there is surely a role for STAC to play in designing the protocol by which indicators are reviewed, selected for use in reporting, and potentially retired.

**Recommendation #3:** STAC should formulate a standing committee to initially develop the process for independent indicator review, selection, and retirement, abiding by the indicator framework. Existing indicators will be mapped onto the framework, illustrating gaps and redundancies. A schedule of indicator development, adoption, and retirement will be developed.

**Recommendation #4:** STAC should host a workshop to initiate development of the watershed health indicators.

### ***Chesapeake Bay 2005 Health and Restoration Assessment***

When this document was presented to STAC at the meeting of 12-13 June 2006, a rather vociferous discussion ensued over the permanent “Draft” status of the document, due to the inability to address the huge number of comments that the draft document solicited in a timely fashion. The following report concerning the comments was provided by Mr. Chris Conner, former CBP Communications Director:

Comments were solicited from a large number of entities, including CBP subcommittees, advisory committees and communications representatives from each signatory of the Chesapeake Bay Program. The major difficulties centered around two primary issues: the large number of reviewers and the amount of time available to Bay Program staff to integrate comments into a revised version.

Another difficulty in the comment process was what came to be known as “dueling comments.” Many times, diametrically opposed comments were provided by different reviewers. When this happened, it was up to the primary editor to weigh those comments and find the best way to communicate that particular idea to the reader.

All comments received electronically were compiled by Bay Program staff into one document. Comments made on print documents are also on file as well.

The comment/revision process should be modified for the 2006 report. The number of people currently allowed to provide comments must be reduced. I would recommend creating two review panels in 2006. One panel - comprised of researchers, scientists and communicators - review the Bay health report. A separate panel of resource managers, policymakers and communicators should review the restoration report. This would help provide a higher level of credibility to the reports by insuring the tone and content of the reports is unbiased.

A second alteration to the 2006 process would be adding additional time for the incorporation of comments. This could be accomplished on the front or back end.

It is obvious that the number of expected comments, the time and effort required to address them in a balanced fashion, and the time allotted to finalize the document were all severely underestimated. While STAC recognizes that this timeline was unique because of the first issuance of the status report, a more commonly utilized approach would be the vetting of the report format before an appropriate technical audience, and then the simple reporting of what the science says. The status report should not be open to revision for political reasons.

**Recommendation #5:** Health and Restoration Assessment Reports should not be produced as “draft”, with widespread invitation to comment. Implementation of a manager’s survey, plus vetting of the indicator framework and adoption of an indicator selection process, should allow for meaningful input and consideration. STAC should develop a process for comment review, categorization, and resolution by a small body.

#### ***Chesapeake Bay Report Card***

IAN has designed a reporting vehicle that is distinct from the Health and Restoration Assessment, and would report on the condition of the Bay on a timely and spatial basis. The report card would be integrated with the ecological forecasts, and would differ from the H&R Assessment in that it would provide regional syntheses. An example of the report card format is attached. Dr. Dennison had proposed such an approach last spring, and a distribution-ready version was in-hand. Discussion with the CBP led to the postponement of a report card until Spring 2007. Dr. Dennison and his staff have had huge success with this format in Australia, and its effectiveness is well-documented. It has great potential as not only a reporting format, but as a tool in motivating spatially-targeted restoration activities. Members of the subcommittee were impressed with the draft efforts, and feel strongly about scientific support of this venture. In fact, it is clear that an activity such as this requires “cover” from political pressures to achieve its full potential.

**Recommendation #6:** STAC should provide review support of the report card, as well as an endorsement of the approach. Since one important aspect of the report card is its timeliness, a subcommittee should be drafted immediately to provide review of the proposed indicators for the upcoming report card, at a planned workshop October 24-25, 2006.

#### ***Are we meeting the larger objective?***

The GAO report recommended a number of actions to be taken, summarized in Figure 2.

Figure 2. Recommendations of the GAO.

### What GAO Recommends

GAO recommends that the Administrator of EPA instruct the Chesapeake Bay Program Office to (1) complete its efforts to develop and implement an integrated assessment approach; (2) revise its reporting approach to improve the effectiveness and credibility of its reports; and (3) develop a comprehensive, coordinated implementation strategy that takes into account available resources. In commenting on this report, the signatories to the *Chesapeake 2000* agreement generally agreed with GAO's recommendations.

The GAO report raises a suite of more general issues concerning the assessment and reporting process for the CBP. For example, the adoption of a large number of indicators, over time, into the CBP monitoring has led to an ad hoc survey design. Indicator monitoring occurs over a huge range of spatial and temporal scales, and very few common sampling locations are utilized for more than one indicator. In addition, a review of Chesapeake Bay indicators illustrated that they are primarily measured in the Bay itself, and rarely monitored in upstream watersheds. This leads to a number of issues:

- The lack of a probabilistic design eliminates the potential use of many state-of-the-art reporting techniques, such as cumulative density functions or confidence intervals. These reporting methods can be quite effective in communicating both with the public and with environmental managers.
- The incongruity between the location of restoration efforts (e.g., riparian buffers in headwater streams) and the monitoring location (the Bay itself) does not allow for a clear assessment of restoration success. Recent Science articles (April 2005) clearly pointed out the lack of data concerning restoration success in CBP; this gap could be largely addressed by rethinking survey design.
- Current survey design does not comprehensively allow for adequate characterization of condition on a regional basis, across all regions of interest. When not all regions are characterized, the motivation for political forces to operate in the interests of restoration cannot be accessed.
- It is probable that the ad-hoc nature of the current sampling regime is not as cost-effective as possible. In a time of limited resources for monitoring, any cost saving could potentially be applied to inclusion of a new, or better, indicator.

**Recommendation #7:** STAC should form a workshop of national and international experts (in monitoring and assessment, not “Bay experts”) where the scientific underpinnings of all aspects of monitoring are re-assessed and updated. A document should be produced which reports on the state of science in the Bay monitoring and assessment program. In this way, a broad range of topics can be assessed simultaneously and in an integrated fashion: indicator design and selection, survey design, analysis, and reporting.

**Conclusions:**

The subcommittee feels that there are a number of roles, from immediate and focused to long-term and general, for STAC to play in the indicator process. Some proposed activities are:

- October 2006; MASC workshop
- December 2006 STAC; Report Card review
- March 2007; indicator framework and selection
- Spring/Summer 2007; State of Science workshop

Thank you for the opportunity to review.